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09/898,823	07/03/2001	Chris Eberspacher		1107

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Chris Eberspacher
Unisun
587-E North Ventu Park Rd, PMB 124
Newbury Park, CA 91320

EXAMINER

TSOY, ELENA

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 07/17/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/898,823

Applicant(s)

EBERSPACHER ET AL.

Examiner

Elena Tsoy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Response to Amendment

Amendment filed on June 27, 2003 has been entered. Claims 1-24 have been cancelled.
New claims 25-50 have been added. Claims 25-50 are pending in the application.

Specification

1. Objection to the specification as failing to provide proper antecedent basis for the claimed subject matter has been withdrawn.

Claim Objections

2. Objection to claim 1 because of informalities has been withdrawn due to cancellation of the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The Examiner Note: in the previous Office Action the Examiner referred to elements in cited references in accordance with CAS version of Periodic table of the elements. However, Applicants clarified that elements in the claims are recited in accordance with previous IUPAC form of Periodic table of the elements. Current Office Action refers to elements in accordance with previous IUPAC form.

5. Rejection of claims 1, 2 under 35 U.S.C. 102(e) as being anticipated by Brezny (US 5,919,727) has been withdrawn.
6. Rejection of claims 1, 3, 4, 6 under 35 U.S.C. 102(b) as being anticipated by Berndt et al (US 4,624,941) has been withdrawn.
7. **Claims 25, 28-33, 38, 39, 46, 47** are rejected under 35 U.S.C. 102(b) as being anticipated by Douglas et al (US 4,023, 961).

Douglas et al disclose a method for making a composite powder (mixed-metal particles), comprising providing at least one metal oxide in the form of a solution; and intimately mixing the solution of said at least one metal oxide with the solution of said at least one metal or its oxide (See column 2, lines 1-11), forming droplets of the solution (See column 2, lines 41-47) and thermally decomposing (pyrolyzing) the contents of the droplets (See column 2, lines 11-16; column 9, lines 50-57) to form metal/metal oxide (metal phase enveloped by metal oxide phase), a metal (non-oxide phase)/metal oxide or metal oxide/metal oxide (multiple metal oxide phases) powdered composite as a result of reacting the atomised mixed solution (See column 2, lines 8-10, 28-31). Typical powdered materials that can be produced are silver, gold, any combination of these metals, copper (IB) oxide, cadmium (IIB) oxide, zinc (IIB) oxide, indium (IIIB) oxide, tin (IVB) oxide, ruthenium oxide, cobalt oxide, tantalum oxide, tungsten oxide, lanthanum oxide,

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strontium oxide, chromium oxide, iron oxide, magnesium oxide, manganese oxide, calcium oxide, barium oxide, tellurium oxide and lithium oxide. Alternatively, a composite powdered material can consist of at least one of the listed metals and at least one of the listed oxides or at least two of the listed oxides. See column 2, lines 19-31.

Douglas et al further teach that the atomised mixed nitrates solution can be decomposed by being passed through a gas flame, hot air (oxidizing atmosphere) or any other heating method wherein a reaction zone is maintained at a temperature *above the decomposition temperatures* of the constituent nitrates e.g. a temperature of 550 °C in the case of the silver and cadmium nitrates. It is the Examiner's position that formed powder would be single-phase powder since according to specification, "oxidizing ambient gases are particularly advantageous for making oxide final materials; for example, oxygen is advantageous in making single-phase Cu₂In₂O₂ particles" (See specification page 11).

8. **Claims 26, 34, 36, 37, 40, 42-45, 48-50** are rejected under 35 U.S.C. 103(a) as being unpatentable over Douglas et al (US 4,023, 961) in view of Ranade et al (US 5,928,405).

Douglas et al are applied here for the same reason as above. Douglas et al fail to teach the method can produce powder having particles with an average diameter of less than about 1 micron (Claims 26, 34, 40, 48) by heating the droplets in a reducing atmosphere (Claims 36, 50) such as hydrogen (Claim 37) or in a non-oxidizing atmosphere (Claim 42) or a substantially inert atmosphere (Claims 44, 49) such as nitrogen (Claims 43, 45).

Ranade et al teach that finely divided, spherically shaped, non-hollow, fully densified metallic particles in micron and submicron size ranges with selectable upper and lower size cuts (See column 2, lines 41-49) suitable for electronic applications (See column 1, lines 25-28) can

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be made by producing an aerosol of atomized solutions of metal compounds with a carrier gas such as air, nitrogen, hydrogen, and thermally decomposing the metal compounds in the carrier gas (See column 3, lines 21-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified a method of Douglas et al producing an aerosol of atomized solutions of metal compounds with a carrier gas such as air, nitrogen, hydrogen, and thermally decomposing metal compounds in the carrier gas with the expectation of providing the desired finely divided, spherically shaped, non-hollow, fully densified metallic particles in micron and submicron size ranges with selectable upper and lower size cuts, e.g. of less than 1 micron suitable for electronic applications, as taught by Ranade et al.

9. **Claims 26, 34, 36, 37, 40, 42, 48, 50** are rejected under 35 U.S.C. 103(a) as being unpatentable over Douglas et al (US 4,023, 961) in view of Schmidberger et al (US 4,396, 420).

Douglas et al are applied here for the same reason as above. Douglas et al fail to teach the method can produce powder having particles with an average diameter of less than about 1 micron (Claims 26, 34, 40, 48) by heating the droplets in a reducing atmosphere (Claims 36, 50) such as hydrogen (Claim 37) or in a non-oxidizing atmosphere (Claim 42).

Schmidberger et al teach that homogeneous multi-component particles in the range of less than 1 micron suitable for making multi-component electrical contacts (See column 1, lines 31-35) can be made by effectively homogenizing individual components of the composite material in the liquid phase, spraying a homogenized solution into the hot reactor, wherein the solvent evaporates suddenly, leaving the solid components behind in which the homogeneity of the liquid-phase element distribution is practically retained, reacting the formed solid particles

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with the ambient gas in the hot reactor (See column 2, lines 57-65). The final product depends on gas used: metal oxide is produced from the metallic compound by absorbing oxygen; metals are produced by reducing the metallic compound in a reducing atmosphere such as hydrogen (See column 2, lines 52-56), or by the dissociation of the metallic compound to the metal and the gaseous decomposition products of the metallic compound (See column 2, lines 57-69). The brief dwell time of the particles in the hot reaction zone (several seconds) does not permit the grain to grow beyond the range of 1 micron (See column 3, lines 1-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have decomposed a homogeneous solution of Douglas et al by spraying the solution into a hot reactor with a brief dwell time in the presence of hydrogen or oxygen or inert atmosphere with the expectation of providing the desired homogeneous multi-component particles in the range of less than 1 micron containing metals and/or metal oxides, as taught by Schmidberger et al depending on intended use of a final product.

10. **Claims 27, 35, 41** are rejected under 35 U.S.C. 103(a) as being unpatentable over Douglas et al (US 4,023, 961) in view of Yamada et al (US 4,173,518).

Douglas et al are applied here for the same reason as above. Douglas et al fail to teach the powdered material further includes gallium so that it comprises Cu, In and Ga.

Yamada et al teach that spray decomposition of metal compounds (See column 7, lines 19-20) comprising among others Cu, In and Ga (See column 3, lines 29-43; column 5, lines 45-55) can be used for making composite perovskite structure oxides suitable for making non-consumable electrodes (See column 1, lines 46-47).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used metal compounds solutions comprising among others Cu, In and Ga compounds for thermally decomposing in a method of Douglas et al with the expectation of providing the desired composite perovskite structure oxides comprising Cu, In and Ga suitable for making non-consumable electrodes, as taught by Yamada et al.

11. **Claims 30-32, 36** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Asada et al (US 5,964,918).

Asada et al disclose a method for making mixed-metal particles, comprising: preparing a solution comprising dissolved salt of a (major) metal selected from Cu (IB) and Al (IIIB) (See column 2, lines 36-43) and a dissolved salt of "metal or the like" selected from Al (IIIB), Si (IVB), Ge (IVB), Pb (IVB) (See column 2, lines 53-63; column 3, lines 25-38, 66-67); forming droplets of the solution; and heating the droplets to pyrolyze the contents of the droplets to form mixed-metal particles (See column 4, lines 1-11). The atmosphere at the time of heating may be suitably selected from oxidizing, reducing and inert atmospheres depending upon the kind of the metal and the metal or semimetal added, heating temperature and the like (See column 4, lines 11-15).

Asada et al further teach that there is no need for the metal powder to be entirely coated with the "metal or the like". Although the deposition of the "metal or the like" in a very small amount on the metal powder suffices for the effect of preventing the fusing, the upper limit of the amount is not particularly limited. See column 3, lines 33-46. Thus, Asada et al do not expressly show that the "metal or the like" substantially envelope the major metal.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substantially enveloped the major metal with the "metal or the like" in a method of Asada et al with the expectation of preventing the fusing, as taught by Asada et al depending on intended use of a final product.

Response to Arguments

12. Applicant's arguments with respect to claims 25-50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (703) 605-1171. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Elena Tsoy
Examiner
Art Unit 1762

July 11, 2003



MICHAEL BARR
PRIMARY EXAMINER